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MINERAL INDUSTRY SURVEYS

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ZINC IN DECEMBER 1997

Domestic mine production in December, expressed in content of ore, increased by more than 8% over the previous month's production, while smelter production remained the same. Apparent consumption in December stayed the same as in November, but was about 35% lower than in December 1996.

The *Platt's Metals Week* composite price for North American Special High Grade zinc declined by more than 5.5%, but still was nearly 3% higher than a year ago.

Since 1995, world zinc metal production has been lagging behind consumption, drawing down London Metal Exchange (LME) stocks from a peak of 1.6 million metric tons in 1994 to 379,500 tons at the end of August 1997. During the last 4 months, increased exports from Eastern European and socialist countries (particularly China), and, to lesser extent, economic difficulties in some Asian countries, contributed to increased stocks levels. By the end of 1997, the LME stock ended virtually unchanged from a year earlier, at 491,600 tons.

Kit Resources Ltd. (formerly Arauco Resources Ltd.) of Canada has signed a letter-of-intent to purchase the Izok Lake polymetallic property in the Canadian Northwest Territories from Inmet Mining Corp., Canada, for \$40 million. The purchase price includes the Hood River and Gondor properties, the former having resources of 3.2 million tons of ore containing 3.2-4.4% zinc and 1.4-4.1% copper and the latter having 7.3 million tons at a grade of 4.3% zinc and 46 grams/ton (g/t) silver. Izok Lake has reserves of 16.5 million tons grading 11.4% zinc, 2.2% copper, 1.1% lead, and 60 g/t silver. While the deposit is one of the largest base-metal deposits in North America, the mine could not stand alone because of high transportation cost. The operating cost for Kit will be lower than calculated by Inmet, because it owns the nearby George Lake property, allowing it to share transportation cost between the George Lake and Izok Lake properties (Mining Journal, 1997a). In addition, the Canadian Hydrographic Service charted a navigable route for deep-draft vessels to a proposed

port site at the southern end of Bathurst Inlet, 243 kilometers from Izok Lake, further lowering operating costs. The proposed port would benefit nearby Noranda Mineral Inc. deposits at Heath Steele and Half Mile Lake and the newly discovered Mountain Lake Resources' Maliseet Mountain mineralization.

Because of deteriorating market conditions, Cominco Ltd. has canceled its decision to reopen the Sa Dena Hes Mine in the second quarter of 1998. The mine, in southeast Yukon Territory, is owned 50% by Korea Zinc Co. Ltd. and 25% each by Cominco and Teck Corp. The deposit, bought by the partners in December 1993 for about \$43 million, has 1.75 million tons of ore with an average grade of 12.1% zinc, 3.4% lead, and 52 g/t silver (Metal Bulletin, 1997a). The projected output was 50,000 tons of zinc in concentrate per year.

The Cannington Mine, near Cloncurry in Queensland, Australia, owned by BHP Minerals, began ore production in May and concentrate production at the end of November. When in full production, the underground mine will treat 1.5 million tons of ore per year to produce 265,000 tons of lead concentrate and 110,000 tons of zinc concentrate containing 170,000 tons of lead and 50,000 tons of zinc. With a production of 750 tons of contained silver per year, it will be also one of the world's largest silver mines. Most of the zinc concentrate will be purchased by Korea Zinc Co. Ltd. for its future smelter in Townsville. The total resources are estimated at more than 47 million tons of ore. Measured reserves amount to 11 million tons, at a grade of 14% lead and 5.2% zinc (Metal Bulletin Monthly, 1997).

Construction of the 170,000-ton-per-year capacity smelter in Townsville, north Queensland, Australia, is on schedule for commissioning in late 1999. It is being built by Sun Metals Corp., a wholly owned subsidiary of Korea Zinc Co. Ltd. The economic slowdown in South Korea has had only a minimal effect on Korea Zinc thus far, because all exports are sold for dollars but only about 60%-70% of imports are paid for with dollars. About 80% of the 400,000 tons of concentrate that will

be needed for efficient production will be sourced from northwest Queensland mines including Mount Isa and Thalanga, and the above mentioned Cannington mine. The remaining 80,000 tons will be brought in from other Australian and overseas mines.

In 1995, Navan Resources plc of Ireland acquired the Aguas Teñidas Mine in Spain. Plans at the time of purchase included treatment of the ore at the Spanish Government-owned Almagrera processing plant only 21 kilometers away. However, in 1997, Navan purchased Almagrera S.A. through a privatization program. For \$3.3 million and the assumption of \$4.8 million debt, it not only acquired the processing plant, but also the Sotiel mine, roaster, and sulfuric acid plant. The 1997 production at the Sotiel copper-lead-zinc mine was about 750,000 tons of ore generating 35,500 tons of zinc concentrate and 31,000 tons of copper in concentrate. At

present, 35 million tons of sulfide ore has been delineated at the Aguas Teñidas Mine. Indicated resources are 14 million tons at a grade of 4.6% zinc. Navan expects to achieve full production at a rate of 0.8-1 million tons of ore per year by 2001 (Mining Journal, 1997b).

References Cited

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TABLE 1
SALIENT ZINC STATISTICS 1/

(Metric tons)

	1996		1997			
	December	Jan.-Dec.	October	November	December	Jan.-Dec. p/
Production:						
Mine, zinc content of concentrate	44,800	628,000	49,900	46,300	50,200	601,000
Mine, recoverable zinc	42,700	600,000	47,600	44,200	47,900	573,000
Smelter, refined zinc	31,200	366,000	31,000	31,200	31,200	377,000
Oxide (gross weight)	13,800 r/	156,000	14,500	13,100	13,300	164,000
Consumption:						
Refined zinc, reported	53,100	788,000	49,600	46,000 r/	48,000	569,000
Ores e/ (zinc content)	150	1,800	150	150	150	1,800
Zinc-base scrap e/ (zinc content)	8,300	100,000	8,300	8,300	8,300	99,600
Copper-base scrap e/ (zinc content)	14,000	170,000	14,000	14,000	14,000	168,000
Aluminum- and magnesium-base scrap e/ (zinc content)	67	800	67	67	67	804
Total e/	75,600	1,060,000	72,200 r/	68,500 r/	70,500	839,000
Apparent consumption, metal 2/	117,000	1,210,000	91,000	76,000	76,000 3/	1,270,000
Stocks of refined (slab) zinc, end of period:						
Producer 4/	13,700	XX	9,240	10,100	10,100	XX
Consumer 5/	55,700	XX	57,100 r/	57,900 r/	59,600	XX
Merchant	4,800	XX	3,510 r/	18,100 r/	18,500	XX
Total	74,200	XX	69,900 r/	86,100 r/	88,100	XX
Shipments of zinc metal from Government stockpile	2,110	16,500	438	2,690	139	32,300
Imports for consumption:						
Refined (slab) zinc	79,000	827,000	59,000	62,200	NA	805,000 6/
Oxide (gross weight)	4,190	56,300	5,640	5,060	NA	57,200 6/
Ore and concentrate (zinc content)	2,450	15,100	12,700	11,100	NA	45,100 6/
Exports:						
Refined (slab) zinc	132	1,970	386	93	NA	3,310 6/
Oxide (gross weight)	410	5,770	653	524	NA	6,190 6/
Ore and concentrate (zinc content)	44,600	425,000	44,800	9,210	NA	448,000 6/
Waste and scrap (gross weight)	3,310	45,500	3,080	2,230	NA	43,400 6/
Price:						
London Metal Exchange, average, per metric ton	\$1,036.26	\$1,025.03	\$1,280.14	\$1,173.00	\$1,101.74	\$1,316.09
Platt's Metals Week North American Special High Grade, average, ¢ per pound	52.77	51.11	62.09	57.42	54.24	64.56

e/ Estimated. p/ Preliminary. r/ Revised. NA Not available. XX Not applicable.

1/ Data are rounded to three significant digits, except prices; may not add to totals shown.

2/ Smelter production plus imports minus exports plus shipments from Government stockpile plus stock change.

3/ Data based on reported consumption, stocks and estimated trade data.

4/ Data from U.S. Geological Survey and American Bureau of Metal Statistics.

5/ Includes an estimate for companies that report annually.

6/ Includes data through November only.

TABLE 2
REFINED ZINC PRODUCED IN THE UNITED STATES 1/

(Metric tons)

Month	Beginning stocks 2/	Production	Shipments	Ending stocks 2/
1996:				
December	11,800	31,200	32,300	10,800
Total	XX	366,000	363,000	XX
1997: p/				
January	10,800	32,700	32,200	11,300
February	11,300	29,300	29,800	10,800
March	10,800	31,300	30,400	11,600
April	11,600	31,900	31,400	12,100
May	12,100	33,300	33,300	12,100
June	12,100	31,600	33,200	10,500
July	10,500	32,500	31,900	11,100
August	11,100	30,800	29,600	12,300
September	12,300	30,700	31,700	11,300
October	11,300	31,000	33,100	9,240
November	9,240	31,200	30,300	10,100
December	10,100	31,200	31,200	10,100
Jan.-Dec.	XX	377,000	378,000	XX

p/ Preliminary. XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes stocks held at locations other than smelters.

Sources: U.S. Geological Survey and American Bureau of Metal Statistics.

TABLE 3
ZINC OXIDE PRODUCED 1/ IN THE UNITED STATES 2/

(Metric tons, gross weight)

Month	Beginning stocks	Production	Shipments	Ending stocks
1996:				
December	3,180	13,800	13,500	3,480
Total	XX	156,000	160,000	XX
1997: p/				
January	3,480	13,000	13,300	3,190
February	3,190	12,200	12,000	3,380
March	3,380	13,400	12,700	4,120
April	4,120	13,600	13,600	4,040
May	4,040	14,100	14,200	3,920
June	3,920	14,500	13,800	4,700
July	4,700	13,900	14,100	4,550
August	4,550	13,700	14,300	3,940
September	3,940	14,200	14,600	3,590
October	3,590	14,500	14,700	3,420
November	3,420	13,100	12,500	4,040
December	4,040	13,300	12,400	4,940
Jan.-Dec.	XX	164,000	162,000	XX

p/ Preliminary. XX Not applicable.

1/ Excludes impure zinc oxide produced from other processes.

2/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 4
ESTIMATED DISTRIBUTION 1/ OF ZINC OXIDE SHIPMENTS BY INDUSTRY 2/ 3/

(Metric tons, gross weight)

Industry	1996		1997 p/			
	December	Jan.-Dec.	October	November	December	Jan.-Dec.
Agriculture	W	W	W	W	W	W
Ceramics	454	6,180	894	724	642	6,600
Chemicals	2,570	32,700	2,880	2,860 r/	2,930	31,900
Paints	308	6,790	594	464	487	6,350
Photocopying	W	W	W	W	W	W
Rubber	7,240	108,000	9,730	7,900	7,790	98,800
Other	503	6,260	557	557 r/	556	6,000
Total	11,100	160,000	14,700	12,500	12,400	150,000

p/ Preliminary. r/ Revised. W Withheld to avoid disclosing company proprietary data; included with "Other."

1/ Distribution of U.S. producers only. Imports excluded because distribution by industry cannot be distinguished.

2/ May include in-house consumption.

3/ Data are rounded to three significant digits; may not add to totals shown.

TABLE 5
APPARENT CONSUMPTION OF REFINED ZINC ACCORDING TO INDUSTRY USE AND PRODUCT 1/

(Metric tons)

Industry and product	1996		1997 p/			
	December	Jan.-Dec.	October	November	December	Jan.-Dec.
Galvanizing:						
Sheet and strip	47,900	494,000	36,300 r/	31,000 r/	29,800	411,000
Other	17,100	160,000	10,700 r/	8,100 r/	7,600	116,000
Total	65,000	654,000	47,000	39,100	37,400	527,000
Brass and bronze	14,300	155,000	11,900	9,200 r/	8,700	125,000
Zinc-base alloy	21,000	229,000	15,300	11,300 r/	13,600	170,000
Other uses 2/	16,800	173,000	16,900	16,500 r/	16,300	171,000
Total	117,000	1,210,000	91,000	76,000	76,000 3/	994,000

p/ Preliminary. r/ Revised.

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Includes zinc used in making zinc dust, desilvering lead, powder, alloys, anodes, chemicals, castings, light metal alloys, rolled zinc, and miscellaneous uses not elsewhere specified.

3/ Data based on reported consumption, stocks and estimated trade data.

TABLE 6
AVERAGE MONTHLY ZINC PRICES

Month	North American Special High Grade, ¢/lb	LME cash	
		¢/lb	\$/mt
1996:			
December	52.77	47.00	1,036.26
Year average	51.11	46.50	1,025.03
1997:			
January	55.17	49.28	1,086.52
February	59.26	53.50	1,179.38
March	62.69	56.92	1,254.80
April	61.97	56.26	1,240.40
May	64.94	59.44	1,310.51
June	66.12	61.42	1,354.18
July	73.25	68.85	1,517.96
August	79.15	75.00	1,653.51
September	78.47	74.43	1,640.89
October	62.09	58.07	1,280.14
November	57.42	53.21	1,173.00
December	54.24	49.97	1,101.74
Year average	64.56	59.70	1,316.09

Source: Platt's Metals Week.

TABLE 7
U.S. EXPORTS OF ZINC 1/

Material	1996		1997			
	Quantity (metric tons)	Value (thousands)	November		Year to date 2/	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	1,970	\$2,350	93	\$120	3,310	\$4,380
Ore and concentrate (zinc content)	425,000	190,000	9,210	6,430	448,000	311,000
Waste and scrap (gross weight)	45,500	30,300	2,230	2,000	43,400	31,400
Powders, flakes, and dust (zinc content)	11,100	21,400	1,130	2,000	9,020	17,300
Oxide (gross weight)	5,770	9,430	524	691	6,190	10,900
Chloride (gross weight)	1,470	1,230	105	64	2,610	1,770
Sulfate (gross weight)	5,230	2,970	553	298	5,340	3,050
Compounds, other (gross weight)	1,250	4,670	10	57	201	865

1/ Data are rounded to three significant digits.

2/ Data for the current month were not available at time of publication.

Source: Bureau of the Census.

TABLE 8
U.S. IMPORTS FOR CONSUMPTION OF ZINC 1/

Material	1996		1997			
	Quantity (metric tons)	Value (thousands)	November		Year to date 2/	
			Quantity (metric tons)	Value (thousands)	Quantity (metric tons)	Value (thousands)
Refined (slab) zinc	827,000	\$882,000	62,200	\$83,000	805,000	\$1,100,000
Ore and concentrate (zinc content)	15,100	6,380	11,100	8,580	45,100	28,200
Waste and scrap (gross weight)	31,900	12,800	1,710	1,030	26,800	12,900
Powders, flakes, and dust (zinc content)	10,300	17,600	1,570	3,280	10,700	22,200
Oxide (gross weight)	56,300	57,500	5,060	6,400	57,200	67,100
Chloride (gross weight)	2,420	2,140	139	122	1,900	1,360
Sulfate (gross weight)	4,050	2,840	628	340	6,230	3,490
Compounds, other (gross weight)	1,190	1,280	134	166	1,390	1,740

1/ Data are rounded to three significant digits.

2/ Data for the current month were not available at time of publication.

Source: Bureau of the Census.

TABLE 9
SHIPMENTS OF ZINC METAL FROM THE NATIONAL DEFENSE
STOCKPILE 1/

(Metric tons)

Month	Beginning inventory	Shipments	Ending inventory
1996:			
December	259,000	2,110	257,000
Total	XX	16,500	XX
1997:			
January	257,000	3,020	254,000
February	254,000	4,400	250,000
March	250,000	5,080	245,000
April	245,000	5,480	239,000
May	239,000	3,750	236,000
June	236,000	1,750	234,000
July	234,000	860	233,000
August	233,000	3,340	230,000
September	230,000	1,490	228,000
October	228,000	438	228,000
November	228,000	2,690	225,000
December	225,000	139	225,000
Year to date	XX	32,300	XX

XX Not applicable.

1/ Data are rounded to three significant digits; may not add to totals shown.

Source: Defense Logistics Agency.

TABLE 10
U.S. IMPORTS OF ZINC, BY TYPE OF MATERIAL AND COUNTRY 1/

(Metric tons)

Material and country	General imports			Imports for consumption		
	1996	1997 2/		1996	1997 2/	
		November	Year to date		November	Year to date
Ore and concentrate (zinc content):						
Australia	--	5,190	15,100	--	5,190	15,100
Mexico	7,000	350	7,270	6,970	350	7,270
Peru	10,000	4,080	20,200	8,080	4,040	19,100
Other	322	1,520	4,270	91	1,480	3,690
Total	17,300	11,100	46,900	15,100	11,100	45,100
Blocks, pigs, or slab:						
Brazil	32,000	--	21,900	32,000	--	21,900
Canada	503,000	40,900	429,000	503,000	41,300	430,000
Finland	18,300	--	15,100	18,300	--	15,100
Mexico	93,900	7,210	75,200	93,900	7,210	75,200
Peru	23,800	2,200	17,300	23,800	2,200	17,300
Russia	24,100	--	26,400	24,100	--	26,400
Spain	83,200	6,590	82,900	91,400	6,590	94,000
Sweden	--	--	12,500	--	--	3,860
Other	40,500	4,910	121,000	40,900	4,920	121,000
Total	819,000	61,800	801,000	827,000	62,200	805,000
Dross, ashes, & fume (content)	15,800	1,370	16,000	15,800	1,370	16,000
Grand total	852,000	74,300	864,000	858,000	74,600	866,000
Oxide (gross weight):						
Canada	28,600	3,150	30,600	28,600	3,150	30,600
China	2,070	75	2,530	2,070	75	2,530
Mexico	21,400	1,670	18,900	21,400	1,670	18,900
Other	4,420	165	5,190	4,310	165	5,160
Total	56,400	5,060	57,200	56,300	5,060	57,200
Other (gross weight):						
Waste and scrap	31,900	1,710	26,800	31,900	1,710	26,800
Sheets	16,900	49	19,200	16,900	49	19,200
Dust, powder, flakes	10,300	1,570	10,700	10,300	1,570	10,700

1/ Data are rounded to three significant digits; may not add to totals shown.

2/ Data for the current month were not available at time of publication.

Source: Bureau of the Census.